APR 2 3 1988

FLOOD INSURANCE STUDY

BOROUGH OF NEW FLORENCE, PENNSYLVANIA
WESTMORELAND COUNTY

JUNE 3, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER - **420890**

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
BOROUGH OF NEW FLORENCE, WESTMORELAND COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Borough of New Florence, Westmoreland County, Pennsylvania, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Pittsburgh District of the U. S. Army Corps of Engineers (COE) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1822, Project Order No. 1, Amendment No. 25. This work was completed in December 1986.

1.3 Coordination

On May 4, 1987, a final Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the borough, and the COE (the study contractor) to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Borough of New Florence, Westmoreland County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

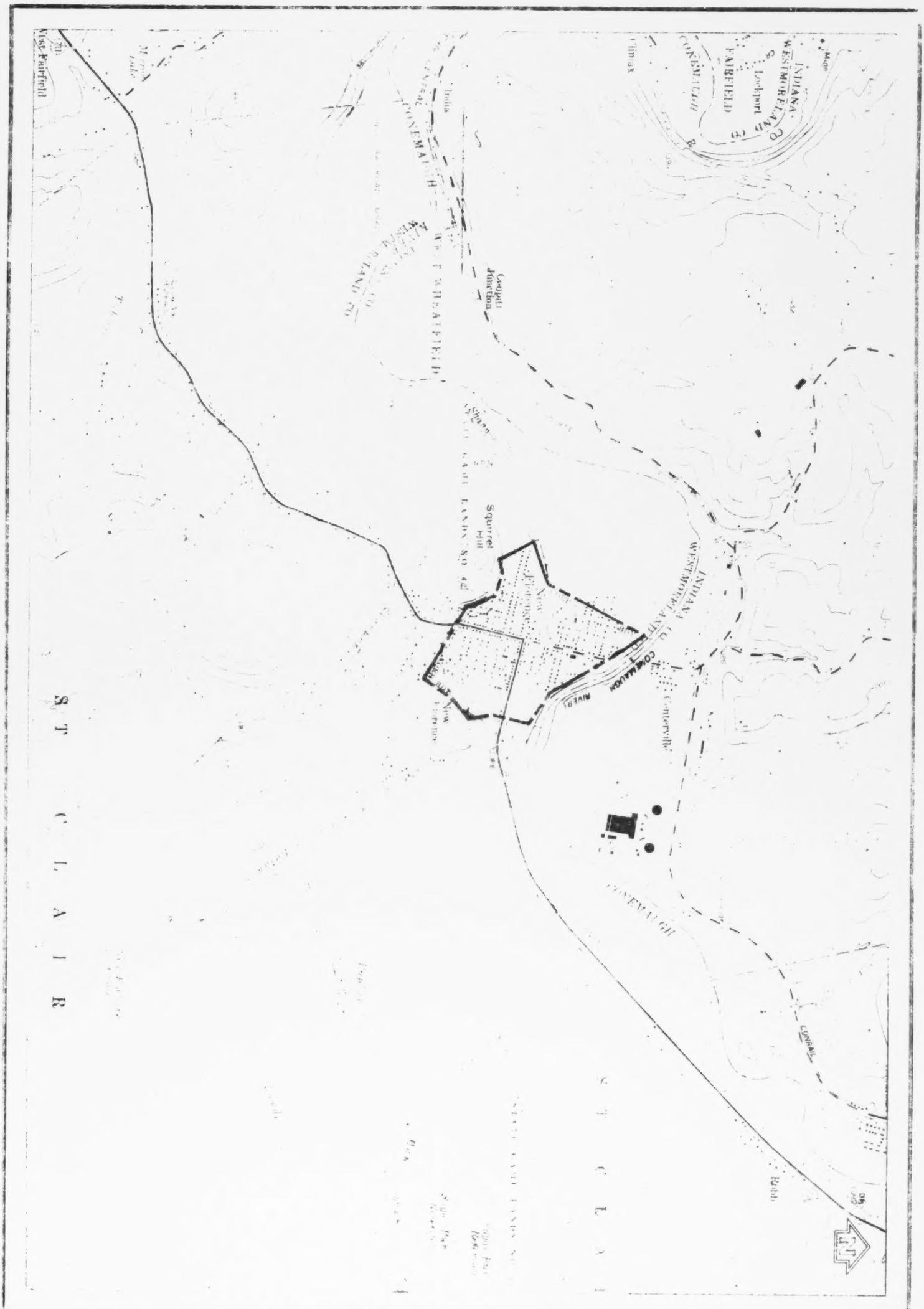


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOROUGH OF NEW FLORENCE, PA

(WESTMORELAND CO.)

APPROXIMATE SCALE

2000 4000 6000 FEET

VICINITY MAP

The Conemaugh River was studied by detailed methods for its entire length within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through December 1991.

2.2 Community Description

The Borough of New Florence is located in the northeastern corner of Westmoreland County in southwestern Pennsylvania, approximately 60 miles east of the City of Pittsburgh and just northwest of the City of Johnstown. It is bordered by the Township of St. Clair to the east, south, and west; and the Township of West Wheatfield to the north. The borough covers an area of approximately 0.1 square mile. The 1980 population of the borough was 855, an 8.7 percent decrease from the 1970 population of 929 (Reference 1).

The Conemaugh River, with a total drainage area of 1,373 square miles at its mouth, joins with Loyalhanna Creek at Saltsburg, Pennsylvania, to form the Kiskiminetas River. It flows in a generally northwest direction from Johnstown through Westmoreland, Cambria, and Indiana Counties and is impounded along the way by Conemaugh River Lake. The total reach of the Conemaugh River from Johnstown to Saltsburg is approximately 52.5 miles. The average gradient in the study reach is 7.7 feet per mile. Local relief above the stream valley varies from a low of 1,016 feet to an average hilltop elevation of 2,300 feet. The valley floor area varies from approximately 200 to 1,000 feet in width.

The climate for this area is temperate, with a seasonal variation in temperature. The area is geographically located in a region of variable air mass activity, subjected to both polar and tropical, continental and maritime air mass invasions. The weather is usually moderate but is subject to frequent and rapid changes as a result of air mass movements. Measurable precipitation occurs approximately 92 days a year and amounts to approximately 45 inches. Average monthly temperatures range from 31 degrees Fahrenheit (^{O}F) in January to 73^{O}F in July.

2.3 Principal Flood Problems

Major floods have occurred along the Conemaugh River at various times of the year. Floods occurring during the winter and spring are usually the result of high intensity, short duration storms. It is possible for large floods with a duration of several days to occur at any time of the year.

The maximum flood of record along the Conemaugh River in New Florence occurred in July 1977 when the river rose to a gage height of 27.06 feet at Seward, Pennsylvania. The following tabulation

shows major floods on the Conemaugh River as measured at U. S. Geological Survey (USGS) gaging station No. 03041500 at Seward, Pennsylvania, at river mile 42.85.

Date of Crest	Stage (feet)	Elevation (feet)	Discharge (cfs)
July 20, 1977	27.06	1,103.80	115,000
March 18, 1936	22.80	1,093.82	90,000
October 16, 1954	19.20	1,095.22	60,000
June 23, 1972	18.93	1,094.95	57,000**
April 26, 1937	*	*	38,000
March 31, 1940	15.22	1,091.24	34,000
March 6, 1967	14.14	1,090.16	29,200
February 25, 1961	14.02	1,090.04	29,000
March 6, 1945	13.76	1,089.78	27,500
April 3, 1970	13.46	1,089.48	26,500

Note: Gage Zero equals 1,076.02 feet
*Data not available
**Discharge based on high-water mark

2.4 Flood Protection Measures

There are no major flood control structures or local flood protection projects on the Conemaugh River that would affect flooding within the Borough of New Florence.

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding source studied in detail affecting the community.

Natural discharge-frequency curves on the Conemaugh River were developed by a standard log-Pearson Type III analyses as outlined in Bulletin 17B (Reference 2). The stage discharge records used in the analysis of the Conemaugh River were obtained from the USGS gaging station located at Seward, Pennsylvania covering a 43 year period.

A summary of the drainage area-peak discharge relationships for the stream studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CONEMAUGH RIVER					
At USGS gaging station No. 03041500 at Seward, Pennsylvania	715	45,000	83,000	104,000	163,000

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections for the Conemaugh River were obtained from topographic maps at a scale of 1:4,800 with a contour interval of 4 feet (Reference 3). Additional cross sections were obtained from field surveys. All bridges were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 4). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for the Conemaugh River were based on critical depth.

Roughness factors (Manning's "n") used in the hydraulic computations were chosen on the basis of field inspection or verification of roughness requirements in order to reproduce profiles for known floods for which high-water marks were obtained and flow quantities were measured or easily calculated. For the Conemaugh River, the channel "n" values ranged from 0.014 to 0.045, and the overbank "n" values ranged from 0.070 to 0.150. The well-defined flood of July 1977 was successfully reproduced using these channel and overbank "n" values.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the flooding source studied in detail, the 100- and 500-year floodplain boundaries have been delineated using topographic maps at a scale of 1:4,800 with a contour interval of 4 (Reference 3).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodway in this study is presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this study was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for the Conemaugh River extend beyond the corporate limits.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Conemaugh River								
A	37.57	1421/330	23,316	4.5	1,071.6	1,071.6	1,072.6	1.0
B	37.73	1234/0	22,501	4.6	1,073.8	1,073.8	1,074.8	1.0
C	37.97	1413/0	23,142	4.5	1,074.9	1,074.9	1,075.9	1.0

[1]Miles above confluence with Kiskiminetas River
[2]Width/width within corporate limits

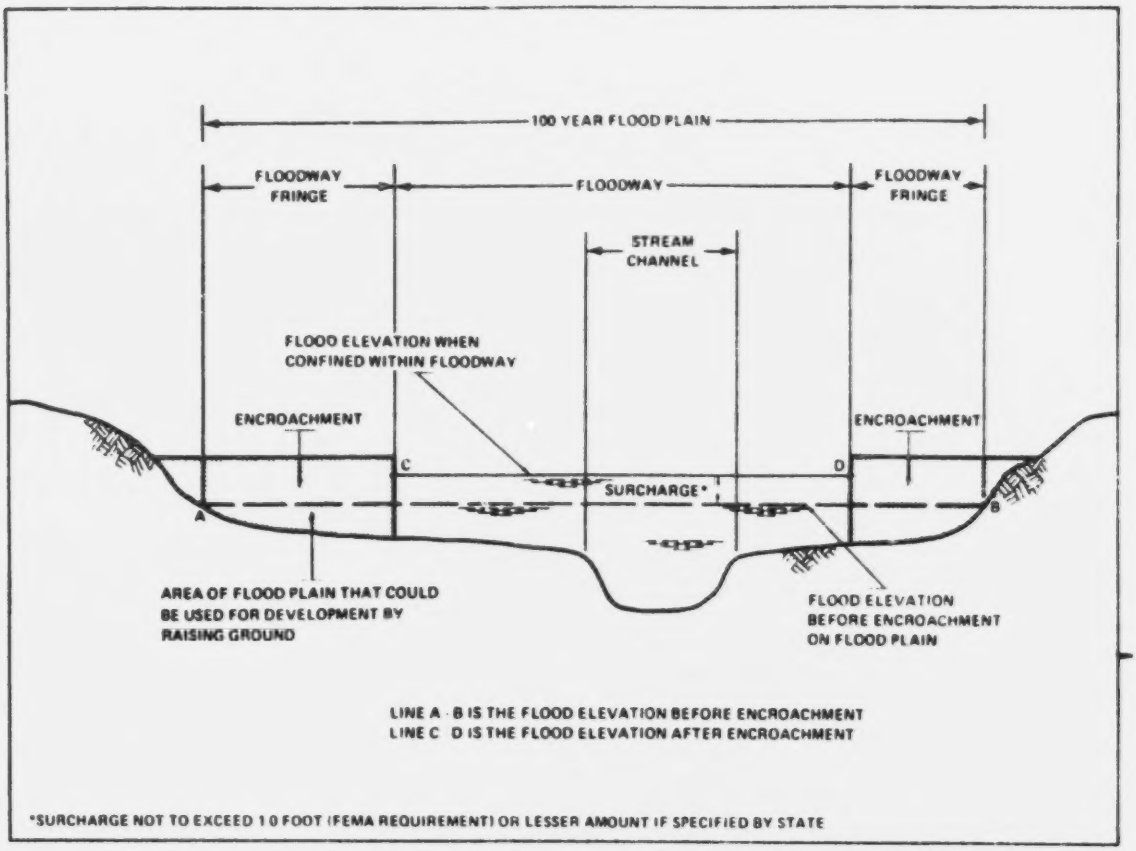
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOROUGH OF NEW FLORENCE, PA
(WESTMORELAND CO.)

FLOODWAY DATA

CONEMAUGH RIVER


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance Study for the Township of St. Clair is currently being prepared (Reference 5). The base flood elevation (BFE) south of CONRAIL at the western corporate limits in this study is different from that of the St. Clair study due to more recent information in this study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of Commerce, Bureau of the Census, 1980 Census of Population, Number of Inhabitants, Pennsylvania, Washington, D. C., U. S. Government Printing Office, 1981.

2. U. S. Department of the Interior, Geological Survey, Office of Water Data Collection, Interagency Advisory Committee on Water Data, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, Reston, Virginia, Revised September 1981.

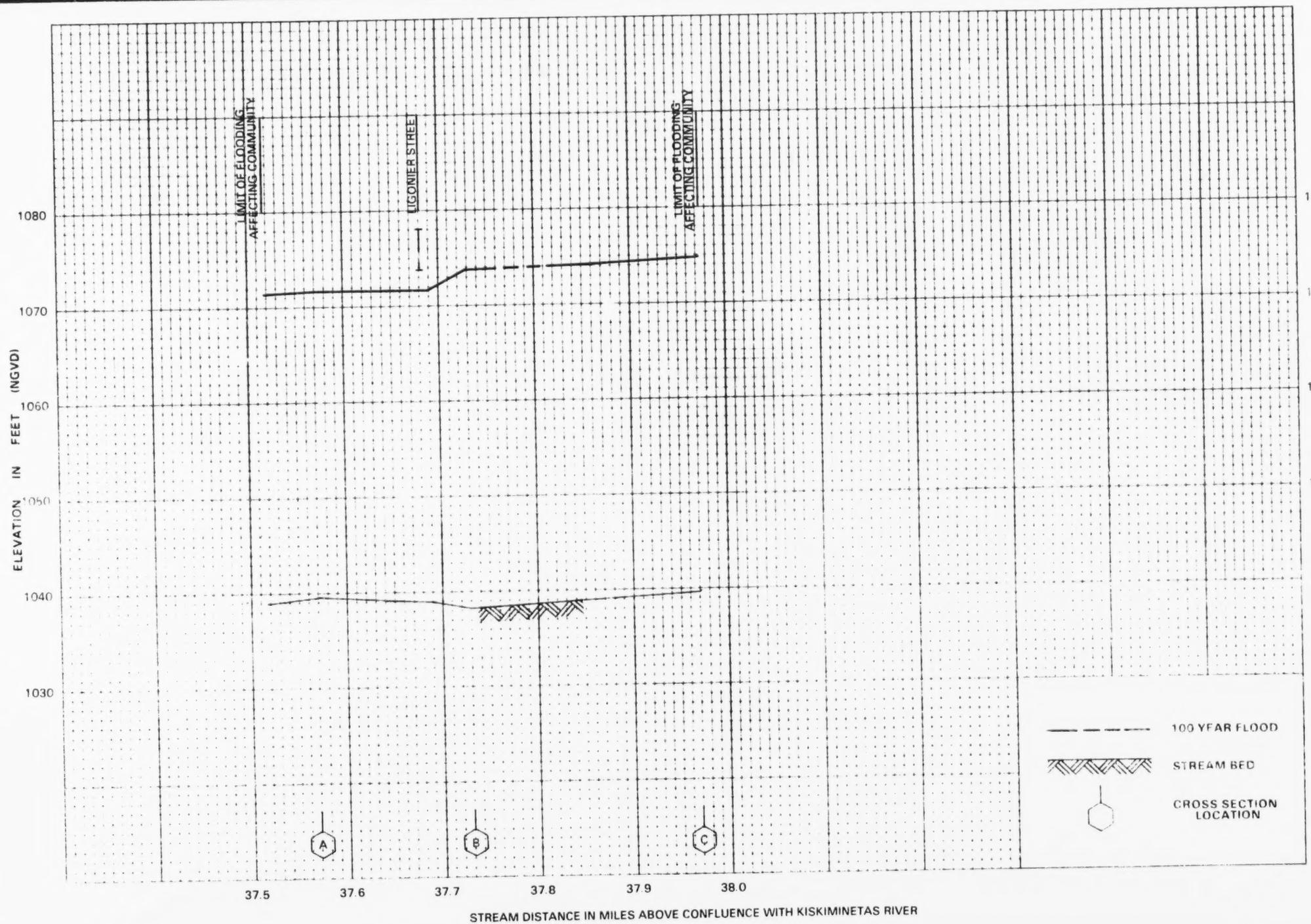
3. Michael Baker, Jr., Inc., of Beaver, Pennsylvania, Topographic Maps compiled from aerial photographs, Scale 1:4,800, Contour Interval 4 Feet: New Florence, Pennsylvania, February 1984.

4. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Users Manual, Davis, California, October 1973.

5. Federal Emergency Management Agency, Flood Insurance Study, Township of St. Clair, Westmoreland County, Pennsylvania (Unpublished).

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	1,080.29	PDH disk set on top of upstream left bank concrete parapet wall of reinforced concrete highway bridge over the Conemaugh River at New Florence.



FLOOD PROFILES

CONEMAUGH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOROUGH OF NEW FLORENCE, PA

(WESTMORELAND CO.)

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